# NATIONAL BUREAU OF STANDARDS REPORT

8976

## REPORT ON VISIT TO PANAMA

(Subject: Weights and Measures Standards Program)

By
H. F. Wollin
Office of Weights and Measures
National Bureau of Standards


U.S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

# THE NATIONAL BUREAU OF STANDARDS

The National Bureau of Standards is a principal focal point in the Federal Government for assuring maximum application of the physical and engineering sciences to the advancement of technology in industry and commerce. Its responsibilities include development and maintenance of the national standards of measurement, and the provisions of means for making measurements consistent with those standards; determination of physical constants and properties of materials; development of methods for testing materials, mechanisms, and structures, and making such tests as may be necessary, particularly for government agencies; cooperation in the establishment of standard practices for incorporation in codes and specifications; advisory service to government agencies on scientific and technical problems; invention and development of devices to serve special needs of the Government; assistance to industry, business, and consumers in the development and acceptance of commercial standards and simplified trade practice recommendations; administration of programs in cooperation with United States business groups and standards organizations for the development of international standards of practice; and maintenance of a clearinghouse for the collection and dissemination of scientific, technical, and engineering information. The scope of the Bureau's activities is suggested in the following listing of its three Institutes and their organizational units.

**Institute for Basic Standards.** Applied Mathematics. Electricity. Metrology. Mechanics. Heat. Atomic Physics. Physical Chemistry. Laboratory Astrophysics.* Radiation Physics. Radio Standards Laboratory:* Radio Standards Physics; Radio Standards Engineering. Office of Standard Reference Data.

**Institute for Materials Research.** Analytical Chemistry. Polymers. Metallurgy. Inorganic Materials. Reactor Radiations. Cryogenics.* Materials Evaluation Laboratory. Office of Standard Reference Materials.

**Institute for Applied Technology.** Building Research. Information Technology. Performance Test Development. Electronic Instrumentation. Textile and Apparel Technology Center. Technical Analysis. Office of Weights and Measures. Office of Engineering Standards. Office of Invention and Innovation. Office of Technical Resources. Clearinghouse for Federal Scientific and Technical Information.**

---

*Located at Boulder, Colorado, 80301.
**Located at 5285 Port Royal Road, Springfield, Virginia, 22171.

# NATIONAL BUREAU OF STANDARDS REPORT

4042215 8976

FOR OFFICIAL USE ONLY

## REPORT ON VISIT TO PANAMA

(Subject: Weights and Measures Standards Program)

By
H. F. Wollin
Office of Weights and Measures
National Bureau of Standards


U.S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

# REPORT ON VISIT TO PANAMA

1. DATE: July 26-28, 1965.

2. PLACE: Panama City, Panama.

3. PURPOSE:

To discuss general considerations for the establishment of a national weights and measures program in Panama with officials of the U. S. Agency for International Development (AID), University of Panama, and Panamanian Government. Arrangements for the visit were made by the U. S. AID Mission in Panama.

4. PERSONS VISITED:

Principal contacts were with Mr. Alberto de St. Malo, Dean, Faculty of Engineering, University of Panama, and Mr. M. D. Kohan, AID Industry Officer. Individual and group discussion was held with over 15 persons during the two-day visit. (See Appendix 1 for list of names of persons visited.)

5. BACKGROUND:

In recognition of the importance of measurement standards to international commerce and to the commercial and industrial development in Latin America, the Department of Commerce, in 1962, sent two experts from the National Bureau of Standards to several Central and South American countries to inquire into the adequacy of weights and measures standards and control in those countries. It was found that a serious lack of adequate standards existed in many areas. However, cognizant officials in each country expressed a keen interest in securing suitable standards and in training personnel for work in the metrology field.

To meet the need for appropriate reference standards and a national system of weights and measures, the National Bureau of Standards was provided with funds by AID, Washington, to procure a set of physical standards and accessory equipment suitable for Latin American countries. Funds were also provided to make translations into Spanish and Portuguese of several important weights and measures publications to help fill the obvious need for literature on weights and measures administration and technology.

The prototype set of reference standards, including instruments and accessory equipment, was manufactured to NBS specifications and delivered to the Bureau for calibration by the summer of 1964. Over the next several months consideration was given to the possible means of utilizing the standards to the best interest of the Latin American nations. One plan called for the standards and equipment to be so assembled and packed that shipment could be made from one country to another for display purposes. Inquiries were sent to all countries to determine their interest in arranging for the display and the training of staff on the use of the new standards.

Several countries expressed an interest in the demonstrations, but Colombia responded with a very generous offer to provide both space and staff for the establishment of a permanent laboratory facility to house and utilize the new standards. The offer from Colombia was made jointly by the Director of the Colombian National Standards Institution (ICONTEC) and the Rector of the National University in Bogota. Mission officers in AID, Bogota, recommended acceptance of the offer and made it clear that the laboratory would be available as a measurement and a training center to serve any Latin American nation that wished to utilize its facilities until such time as that country was prepared to establish its own national laboratory.

The plan to demonstrate the standards in all countries was determined impractical due to the cost, time delay, and technical problems that would be involved in the shipment and setup in each country.

Early in 1965, Colombia was notified that its offer to establish a weights and measures laboratory was accepted. By June the standards were readied and shipped to the National University in Bogota. Engineers from the National Bureau of Standards provided technical assistance to members of the University faculty in the selection and development of the laboratory space. The University put forth considerable effort and provided the necessary funds for the construction of a most suitable laboratory facility.

On June 30, 1965, T. M. Stabler and H. F. Wollin of the NBS Office of Weights and Measures traveled to Bogota for the installation of the reference standards and accessory equipment, and the conduct of a three-week training course in weights and measures supervision and laboratory metrology. Invitations to participate in the training course were sent to all Latin American countries. In addition to those persons selected to represent Colombia, two officials each from Ecuador and Venezuela participated in the course. (For further details on the program in Colombia see NBS Report 8970, "Report on Weights and Measures Standards Program for Latin America.")

6. INTEREST IN PANAMA:

Officials in Panama were among the first to show interest in and support of the Latin American standards program. When inquiries were sent out to each country concerning the demonstration of the prototype standards and accessory equipment, the response from Panama was prompt and enthusiastically in support of the plan. In fact, it is understood that the AID Mission in Panama took immediate steps to arrange for the demonstration program. Plans were worked out cooperatively with Panamanian Government and industrial leaders to implement the anticipated demonstration and training. Expenses were incurred to secure adequate physical facilities, miscellaneous equipment, and to ready personnel.

Obviously, the decision to cancel the demonstration plan came as a disappointment to those who had given their support to the plan.

When it was announced that the standards were to be permanently installed in the laboratory in Colombia and that representatives of the National Bureau of Standards were to conduct training there, word was received through AID that officials of the University of Panama and members of the Society of Panamanian Engineers were interested in conferring with the weights and measures specialists from the Bureau concerning the Colombian setup and the development of a weights and measures program for Panama. Arrangements were made for Mr. Wollin to stopover in Panama City for such discussion during his return to the U. S. from Bogota.

7. MEETINGS AND CONFERENCES:

On arrival in Panama, on Monday, July 26, 1965, Mr. Wollin met with Mr. St. Malo and other members of the Faculty of Engineering at the University of Panama. Discussion centered on the design and use of the newly developed weights and measures standards and on the requirements for a suitable weights and measures laboratory facility. A tour of the engineering laboratories at the University was made later that day.

A conference was held on Tuesday morning with representatives from the University; the Ministry of Agriculture, Commerce, and Industry; the Society of Engineers and Architects of Panama; the Price Control National Committee; and the Institute of Development in Panama. The main object of the conference was to explore ways and means by which a national weights and measures program could be established in Panama. A general review of weights and measures administration and technology in the U. S. was presented and fundamental steps for the inauguration of a similar type standards program was outline. The laboratory in Colombia and the development of a weights and measures program in that country served as a model during the discussion.

On Tuesday afternoon, visits were made to the U. S. Embassy and AID Headquarters for conferences with officials on the situation in Panama and a briefing on the progress that had been made in the Latin American standards program.

Special appointments were arranged for visits with Mr. Ruben D. Carles, Jr., Minister, Agriculture, Commerce, and Industry Ministry and with Mr. Bernardo Lombardo, Rector, University of Panama on Wednesday morning. The respective role of the National Government and University of Panama in the establishment of a weights and measures program was the topic of discussion with these two top officials. Both expressed keen interest in the program and indicated their accord with the general plan for its establishment.

8. SUMMARY:

On the basis of discussion with officials in Panama, the following conclusions and recommendations seem pertinent:

8.1. Establishment of the Program.--It is concluded that the Republic of Panama could benefit greatly from the establishment of a national weights and measures program--a program that would provide the basis for accurate measurement in international and domestic trade, in all commercial transactions, and in industrial and business enterprise. The viewpoint, as expressed by top officials from leading organizations, strongly reflected their interest and willingness to undertake, and abilities to proceed with, a program of weights and measures standards and control.

8.2. Weights and Measures Law.--A comprehensive weights and measures statute is a prime requisite for the establishment of a national program. It is assumed that the Ministry of Agriculture, Commerce, and Industry would be the logical agency of government to administer the weights and measures program. Thus, the necessary legal framework and authority for the program seemingly should be founded in this agency. The Model Weights and Measures Law of the National Conference on Weights and Measures, which has been enacted by the several States of the United States, is recommended for consideration. Copies of a Spanish translation of the Model Law may be obtained from the Office of Weights and Measures, National Bureau of Standards.

8.3. Other Administrative and Technical Publications.--Copies are also available of other National Bureau of Standards publications that have been translated into Spanish for consideration by Latin American countries. These are:

"Model Regulation Pertaining to Packages"

Handbook 44, "Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices"

Handbook 67, "Checking Prepackaged Commodities"

Handbook 82, "Weights and Measures Administration"

8.4. Physical Standards.--It is recommended that the purchase of a basic set of reference standards of length, mass, and volume, together with precision balances and other accessory equipment be included in the program plan. (Laboratory standards and equipment similar to those installed in the weights and measures laboratory in Colombia would be ideal. A brief description of the standards has been listed in Appendix 2. Detailed specifications, photographs, and source of supply of the standards may be obtained on written request to the National Bureau of Standards.)

NBS will furnish, on request, information on field test equipment, such as inspectors test weight kits, portable package checking scales, volumetric test measures, and length measures. (Such field test equipment is necessary in the routine inspection and test of commercial weighing and measuring devices as required under a government enforcement program.)

8.5. Laboratory Facility.--It is suggested that the logical location for the weights and measures laboratory would be at the University of Panama. The University offers the proper scientific environment and appropriate professional skills to carry on a highly technical activity associated with precision measurement.

The laboratory, as operated by the University staff, could provide calibrations and technical services for government agencies, businesses, industries, and private organizations. It could be the center for all measurement to which standards could be referred for test and verification. In addition, the laboratory and other University facilities could serve as a training center for personnel engaged in weights and measures activities.

It is recommended that a member or members of the Faculty of Engineering visit the Laboratory in Colombia to observe the type facilities and other details that are required for a weights and measures laboratory operation.

8.6. Technical Training. --Once the overall program has been sufficiently established, there should be conducted a broad technical training program to include laboratory equipment and techniques, field testing equipment and procedures, technical requirement interpretation, and law enforcement.

Several possibilities for such training are available: (1) Supervisory personnel could receive specialized training at the Colombia laboratory and from Colombian Government officials who have been trained by NBS experts, (2) supervisors or training specialists could arrange for training at the U. S. National Bureau of Standards, and (3) as followup training after either of the above, it may be possible to arrange for NBS personnel to conduct on-the-job training in Panama. The most desirable approach would be to fully utilize the facilities at Colombia for all basic training.

## APPENDIX 1. --PERSONS WITH WHOM DISCUSSIONS WERE HELD IN PANAMA

RUBÉN D. CARLES, Jr.
Ministro de Agricultura, Comercio e Industrias

BERNARDO LOMBARDO
Rector de la Universidad de Panamá

Ing. ALBERTO DE ST. MALO
Decano
Facultad de Ingeniería
Universidad de Panamá

Ing. PHYLLIS A FONG
Directora
Instituto Panameño de Desarrollo

Ing. ALEJANDRO SANTOS E.
Presidente
Sociedad Panameña de Ingenieros y Arquitectos

Arq. RODRIGO MEJIA ANDRION
Director
Colegio de Arquitectos de la
Sociedad Panameña de Ingenieros y Arquitectos

CARLOS L. LOPEZ SCHAW
Jefe del Departamento de Industrias

MAXIMO GALLARDO
Químico Encargado
Laboratorio Industrial
Ministerio de Agricultura, Comercio e Industrias

ALEJANDRO A. AYALA (Representante)
Auditor de la Oficina de Regulación de Precios

Dr. VICTOR LEVI
Director
Laboratorio de Ensayo y Materiales
Facultad de Ingeniería
Universidad de Panamá

RAMON SAAVEDRA, Profesor
Facultad de Ingenieria
Universidad de Panama

FRANK A. MAU
Commercial Attache
U. S. Embassy
Panama

M. D. KOHAN, Industry Officer
U. S. AID Mission
Panama

Group meeting with J. Megellas, K. Kugel, and several other officials at the U. S. AID Mission.

## *ADDENDUM TO TECH NOTE 195*

*The simulated-road tests reported herein were conducted with cars equipped with standard four-ply tires. Tests were conducted after the issuance of this report using cars equipped with the newer two-ply (four-ply rating) tires. The results obtained on the simulator in these tests were not directly comparable to the results obtained during actual road tests. The differences between test results were attributed to the increased tire deflection (reduced rolling radius) on the simulator, as compared to the normal tire deflection on ordinary pavements.*

*Thus, the simulated-road tests cannot be recommended for the testing of odometers installed in vehicles equipped with two-ply tires.*

## APPENDIX 2. --WEIGHTS AND MEASURES LABORATORY STANDARDS DESIGNED FOR NATIONS OF LATIN AMERICA

### MASS STANDARDS

1 piece special 8.0 $g/cm^3$, nonmagnetic, austenitic stainless steel - 1 set 30 kilograms to 1 milligram in the 5, 3, 2, 1 series.
2 each 250-kilogram, nesting stainless steel standards.

### PRECISION BALANCES

3 each one-pan semiautomatic indication of 1 kilogram, 6-kilogram, 30-kilogram capacity.
1 each special 1000-kilogram equal-arm balance.

### CAPACITY STANDARDS

1 each automatic pipette and buret assembly ranging in capacities from 10 milliliters to 5 liters.
1 each 20-liter stainless steel, slicker-plate measure.

### LENGTH STANDARDS

1 each 7-meter precision steel tape.
1 each 5-meter stainless steel length bench subdivided to millimeters, and with accessories.
1 each 30-meter chrome-plated tape.

Also included are miscellaneous instruments and laboratory equipment.


DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS